

From the National Magazine.
THE AUTOMATON CHESS-PLAYER.

ROBERT HOUDIN, the great French conjurer, has retired from the public practice of his profession to enjoy his ease with dignity. One of his latest exploits was the acceptance of a Government mission to Algeria, whose object was simply to astonish the natives. His marvels were so infinitely superior to the false miracles of the Marabouts, or Arab holy men, that the faith of Mussulmen in their fanatic leaders received a serious and salutary shock. The necromancer's last important work has been the composition of his own memoirs, which have just been published in Paris.* It is well known that Houdin executed his most startling tricks by the aid of clever mechanical contrivances, and by the unsuspected application of the ordinary powers of nature, such as chemistry, magnetism, and electricity. His search after recondite mechanism for the pursuit of his vocation several times placed within his reach articles which have now attained the rank of historical curiosities. For instance, in the clock-room of the Conservatoire des Arts et Métiers at Paris there stands, clad in silks and satins, a female mandolin-player, an automaton attributed to the famous Vaucanson (who made amongst other things a duck, which digested as well as ate its food), and repaired, in 1850, by Robert Houdin. Another lucky chance procured him the opportunity of inspecting a still more celebrated automaton, the Chess-player. This was in 1844, at the house of a mechanic named Cronier, who lived at Belville. Respecting the means by which this masterpiece was made to work, Robert Houdin obtained information which, although not differing in principle from explanations already given to the world, is yet so original and so supplemental as to deserve extracting.

It will appear strange that an episode of European history should have to be dragged in to illustrate the construction of an automaton. However, for the reader's comfort, there is no need to enter upon a long and learned discussion touching the balance of power between diverse States. A few words will suffice to introduce the hero of the tale.

The scene lies in Russia. The first partition of Poland, in 1772, left many elements

* *Confidences d'un Prestidigitateur, etc.* Paris: Bourdilliat.

of discord which, several years afterwards, were the cause of numerous insurrections. About the year 1776 a revolt of considerable gravity broke out in a regiment which was half Russian and half Polish, and which kept garrison in the fortified town of Riga. At the head of the rebels was an officer named Worowsky, a man of very superior ability and great energy. He was short in stature, but well made; his strongly marked features, like scars of the fatigues he had undergone, gave to his manly countenance the complete expressions of a tough trooper hardened to the wars. This insurrection acquired such formidable proportions, that the troops who were sent to repress it were twice obliged to beat a retreat, after having suffered considerable loss. Meanwhile, reinforcements arrived from St. Petersburg, and in a battle fought in the open country the insurgents were at length subdued. A great number of the rebels perished, the rest fled across the marches, whither the victorious troops pursued them, with orders to give no quarter.

In this disorderly route Worowsky had both his thighs broken by a shot, and he fell on the field of battle. Nevertheless, he escaped the massacre by throwing himself into a ditch overgrown by a hedge, where he contrived to conceal himself till nightfall, when, dragging himself along with difficulty, he succeeded in reaching the neighboring dwelling of a doctor named Osloff, who was well known for his benevolence and humanity. The doctor, pitying his wretched plight, gave him medical treatment, and consented to harbor him in his house. Worowsky's wounds were serious, in spite of which the good doctor had great hopes of effecting a cure; but gangrene suddenly came on, and the case assumed so threatening a character that, in order to save his life, it was necessary to sacrifice one-half of his body to the other. The amputation of the two thighs was successfully performed, and Worowsky was saved, to survive the wreck and the ruin of a man. Meanwhile, a clever Viennese mechanic, named Von Kempelen, came to Russia to visit Doctor Osloff, with whom he was on terms of intimate friendship. This learned personage was at that time travelling for the purpose of familiarizing himself with foreign languages, the study of which assisted him at a later period in the composition of his work on the mechanism of speech, which was pub-

lished at Vienna in 1791. Previous to Von Kempelen's visit, the doctor for some time had felt uneasy respecting the consequences of the charitable action he had the imprudence to commit; should it come to be known, it might compromise him seriously; his perplexity was extreme; because, living alone with an old housekeeper, he had no one at hand with whom to take counsel, or from whom he could expect the slightest assistance. Von Kempelen's arrival was, therefore, a most fortunate event for the doctor, who reckoned upon his friend's fertile imagination to help him out of the difficulty. Von Kempelen was at first not a little alarmed at having to share so dangerous a secret; he was aware that a price had been set upon the outlaw's head, and that the act of humanity in which he was about to become an accomplice was a crime which the Muscovite laws punished with the utmost rigor. But when he beheld poor Worowsky's mutilated person he yielded to the impulse which so sad a misfortune could not help inspiring, and he set his wits to work to invent some plan which should enable his *protégé* to effect his escape from the Russian territory.

Doctor Osloff was passionately fond of chess, and as well to gratify his own individual taste as to afford some amusement to the sufferer during his long and tedious convalescence, he frequently indulged in a game with him. But Worowsky's superiority was incontestable, and even when Von Kempelen combined his skill with the doctor's Worowsky always won. His decided and constant superiority inspired Von Kempelen with the idea of the famous automaton chess-player. In an instant he had fixed upon his plan, and he set to work immediately. This masterpiece of ingenuity, whose performances astonished the world, was entirely completed within the space of three months.

Von Kempelen wished that the doctor should enjoy the first fruits of his labor, and on the 10th of October, 1776, he invited him to play a game. The automaton represented a Turk as large as life, wearing the national costume, and seated behind a box of the form of a chest of drawers, or side-board, about four feet long, and two-and-thirty inches broad. On the top of the box, and in the middle, was placed a chess-board. Before the commencement of the game the artist opened several doors in the chest of drawers,

by looking into which M. Osloff could see a great quantity of wheel-work, levers, cylinders, springs, and dial-plates, which occupied the greater portion of the space. At the same time Von Kempelen opened a long drawer, from which he took the chess-men, and the cushion on which the Turk rested his arm. When this examination was finished, the robe of the automaton was raised, so as to permit the inspection of the inside of its body. The doors being then closed, Von Kempelen arranged several portions of the machinery, and wound up the wheel-work with a key which he put into a hole in the box. Then the Turk, after slightly nodding his head by way of a salute, placed his hand over one of the chess-men standing on the chess-board, seized it with the tips of his fingers, placed it on a different square, and then laid his arm on the cushion by his side. The inventor had already announced, that as his automaton could not speak it would give three signs with the head for check to the king, and two for check to the queen. The doctor played in turn, and waited patiently till his adversary (whose movements had the gravity of the sultan whom he represented) should have played another piece. Although conducted slowly at the outset, the game soon became complicated. Shortly, Osloff made the discovery that he was pitted against a formidable adversary; for, in spite of all his efforts, his game was almost in a hopeless condition. True, the doctor had fallen into an absent fit. Some strange idea seemed to occupy his mind, but he hesitated to communicate his reflections to his friend, when suddenly the automation made three signs with its head. Check to the king!

"By heavens!" exclaimed the loser, with a trifle of impatience, which, however, was soon dissipated by the sight of his friend's delighted countenance, "if I were not sure that Worowsky is at this moment in bed, I should be ready to swear that I had been playing with him. There is not another head in Russia capable of conceiving the move which has caused me to lose the game. And besides," added the doctor, looking at Von Kempelen fixedly, "will you have the goodness to explain why your automaton plays with its left hand instead of its right, exactly as Worowsky does?"

People who subsequently witnessed its public performances thought that the automaton's

left-handed play was simply a piece of inadvertence and carelessness on the part of the constructor. It was no such thing.

The Viennese mechanic began to smile, and not thinking it worth while to prolong a mystification which was to be the prelude and the rehearsal of so many others, he confessed to his friend that, in fact, it was with Worousky he had been playing.

"But where the deuce have you put him?" asked the doctor, looking around him, in the endeavor to discover his antagonist. The inventor laughed aloud most heartily.

"Well! don't you know me?" cried the Turk, offering the doctor his left hand in sign of reconciliation, while Von Kempelen lifted the robe, and showed the poor mutilated soldier to be lodged in the body of the automaton.

Doctor Osloff could no longer retain his gravity, and he laughed in chorus with his two mystificators. But he was the first to check himself; he wanted an explanation. "How have you contrived," he asked, "to conjure away Worousky, and to render him invisible?"

"Just look," replied Von Kempelen, opening the sideboard. "All these wheels, and levers, and pulleys are nothing but the pretence of an organized machine. The framework which supports them hangs on hinges, and when doubled up and folded on one side, they leave sufficient room for the player to crouch in while you were examining the inside of the automaton. As soon as this first search was over, and when the figure's dress was properly arranged, Worousky got into the body of the Turk, and while I was showing you the chest and the wheelwork it contained, he took the opportunity of introducing his arms and fingers into those of the automaton. You also understand, that in consequence of the thickness of the neck, which is hidden by the beard, and the enormous collar, by placing his head behind the mask he could easily see the chess-board and play his game. I ought to add that, when I pretend to wind up the machinery, it is simply to cover and draw off attention from the movements that Worousky is obliged to make."

"And so," said the doctor, anxious to prove that he perfectly understood the explanation, "while I was examining the chest, that imp Worousky had crept inside the Turk's body; and when the Turk's robe was raised, Worou-

sky had crept into the chest! I frankly own," added M. Osloff, "that I was the dupe of this ingenious contrivance, but I am consoled by thinking that more cunning folks than myself will be taken in by the same manœuvre."

The three friends were mutually delighted at the success of this first private exhibition; for the instrument afforded a marvellous means of escape for the outlawed officer, besides placing him out of the reach of absolute want. Before separating, they agreed about the route advisable to follow in order to reach the frontier speedily, and arranged the precautionary measures which so hazardous a journey demanded. They also decided that, to avoid suspicion, it would be prudent to give a performance in all the towns which lay on their road, beginning with Toula, Kalouga, and Smolensk. A month afterwards Worousky, completely recovered from his wounds, gave in the presence of a numerous public the first proof of his astonishing skill. The bill, written in the Russian language (which is still in the possession of Robert Houdin, who had it from M. Hessler, Dr. Osloff's nephew, who communicated the details of this narrative), ran as follows:—

Toula, Nov. 6, 1777.

IN THE CONCERT-ROOM WILL TAKE PLACE
THE EXHIBITION OF
AN AUTOMATON CHESS-PLAYER,
INVENTED AND CONSTRUCTED BY M. VON
KEMPELEN.

N.B. The mechanical combinations of this piece of machinery are so marvellous and complete that the Inventor does not hesitate to challenge the ablest Chess-players of the town.

It may be readily conceived what an excitement was caused amongst the inhabitants of Toula by the above announcement; not only did the chess-players try hard who should get his name entered first on the list, but heavy bets were offered and taken for and against the antagonists. Worousky was victorious, and, encouraged by his success, he begged Von Kempelen to propose a match the next day, to be played against all the best players in concert. Needless to say that the second defiance was accepted even more eagerly than the first, and that the whole town thronged to be spectators of this novel and interesting tournament. This time the victory remained for awhile uncertain, and Von Kempelen began to tremble for the infallibility of his

automaton's reputation, when an unexpected and masterly move decided the match in favor of Worousky. The whole of the audience, including the losers, hailed this glorious victory with rounds of applause. The columns of the newspapers were filled with praises and congratulations addressed to the automaton and its ingenious inventor.

Von Kempelen and his unseen companion, re-assured about the future by the success of their *debut*, now took their leave of the benevolent doctor. After presenting him with a token of their gratitude for his kind hospitalities, they directed their course towards the frontier. Prudence required that, even while travelling, Worousky should be hidden from every prying eye; consequently, he was literally packed up, exactly like a valuable and brittle piece of furniture. He was "*fragile*," he was "*glass this side upwards*." Under the pretence of the delicacy of the automaton's clock-work, the enormous case in which it was enclosed was carried with the utmost precaution from place to place; the real intention was to insure the safety of the cunning chess-player imprisoned within. Sundry breathing-holes were contrived in unsuspected corners to effect the ventilation of this singular post-chaise. Worousky bore his confinement with patience, for he was supported by the hope of soon being out of the reach of the Muscovite police; and his fatigue and annoyance were in some degree compensated by the large sums of money which they pocketed along the road.

In this fashion, and steadily making for the Prussian frontier, our travellers had got as far as Vitebsk, when one morning Von Kempelen abruptly entered the chamber wherein Worousky was constantly sequestered.

"We are threatened by a terrible misfortune," exclaimed the mechanician, in great alarm, as he displayed a letter from St. Petersburg. "Heaven knows whether we shall be able to avert the evil! The Empress Catherine II., having been informed by the journals of the marvellous skill of the automaton chess-player, desires to play a game with it, and orders me to transport it to her palace immediately. What we have now to do, is to lay our heads together to find the means of avoiding this dangerous honor."

To Von Kempelen's great astonishment, Worousky heard the news without manifesting the least uneasiness; on the contrary, he

appeared delighted at the prospect. "We will take good care not to neglect paying such a visit as that!" he said. "The Czarina's wishes are commands which cannot be disobeyed with impunity; we have, therefore, no other course to follow than to comply with her request as soon as possible. Your readiness to oblige her will have the double advantage of prepossessing her mind in your favor, as well as of diverting any suspicions which your wonderful automaton might raise in her mind. Moreover," added the intrepid soldier, with a certain degree of pride, "I own that I shall not be sorry to meet the great Catherine face to face, and show her that the head which she undervalues to the degree of putting on it the price of a few roubles only, is a match for her own; and may perhaps prove itself, in certain cases, superior in intelligence."

"Madman!" exclaimed Von Kempelen, frightened at the excitement of the fiery outlaw. "Recollect that we may be discovered; which will cost you your life, and will convert me into a Siberian exile."

"Impossible!" calmly answered Worousky. "Your ingenious machine has already deceived so many people, who were no fools either, that I am certain we shall soon have one dupe more; and this time it will be a dupe whom it will be glorious for us to mystify. What a delightful remembrance! what an honor for us both, my dear friend, will it be to have to say one day that the Empress Catherine II.—the haughty Czarina—whom her courtiers vaunt as the owner of the ablest head in her whole empire, was tricked by your genius and beaten by mine!"

Although Von Kempelen could not share Worousky's enthusiasm, he was obliged to bend before circumstances, and the well-known inflexibility of his comrade's character. Besides, the soldier had such a surprising mastery of chess, that the Viennese mechanician thought it prudent to make concessions, in the interest of his own proper reputation. They started, therefore, without delay; for the journey was long and difficult, in consequence of the innumerable precautions with which the transport of Worousky's case was attended. On the road Von Kempelen never left his travelling-companion an instant alone, and did all that lay in his power to soften the rigor of so painful a mode of locomotion. After a series of long and fatiguing days'

journeys, they arrived at last at the end of their travels. But whatever promptitude the travellers had displayed, the Czarina, when she accosted Von Kempelen, appeared to manifest a touch of ill-humor.

"Are the roads so bad, sir," she inquired, "that it takes a fortnight to come from Vitebsk to St. Petersburg?"

"May it please your majesty," replied the wily mechanic, "to permit me to make a confession which will serve in some sort as an excuse for the delay."

"Make it," answered Catherine, "provided it be not an avowal of the incapability of your marvellous machine."

"Quite the contrary. I wish to own to your majesty that, in consequence of your majesty's great ability at chess, I was anxious to present you with a worthy adversary. Before setting out I therefore added some additional mechanism, which was indispensable for the playing of so important a match."

"Ah, that is it!" said the Empress, restored to good humor by this flattering explanation. "And in consequence of this supplemental clock-work I suppose you expect to beat me with your automaton?"

"I shall be greatly surprised if such is not the result," replied Von Kempelen, with the utmost respect.

"We shall see about that, sir," retorted the Empress, tossing her head with an air of doubt and of irony. "But," she continued, in the same tone, "when will you introduce me to the presence of my terrible adversary?"

"Whenever it may please your majesty."

"In that case, I am so impatient to measure my strength with the vanquisher of the ablest players in Russia, that this very evening I will meet him in my library. Instal your machinery there. At eight o'clock I will come and see you. Be punctual."

Von Kempelen retired from the presence, and hastened to make his arrangements for the evening. Worosky treated the matter lightly, and thought only of the delight he should feel at mystifying Catherine. But if Von Kempelen had also summoned courage to go through with the adventure, he was anxious, nevertheless, to take every possible precaution to prevent the secret from being discovered, and to provide a way of escape in case of danger. At all risks, he caused the automaton to be transported to the Imperial palace in the same case in which it was kept when on a journey.

The clock struck eight as the Empress, followed by a numerous suite, entered the library, and took her place before the chess-board. It ought to be mentioned that Von Kempelen never allowed any one to go behind the automaton, and that he would not consent to begin the game till all the spectators were ranged in front of his machine. The court took their places behind the Empress, and prophesied with one voice the impending defeat of the automaton. At the mechanic's invitation, an examination was made of the sideboard and the body of the Turk; and when every one was perfectly convinced that it contained nothing but the clock-work previously mentioned, they took the usual steps to begin the game.

Favored by chance, Catherine enjoyed the advantage of playing the first pawn. The automaton made a move in return, and the game went on in the midst of the most solemn silence. For a time no very decisive move was made; but it soon became apparent, from the Czarina's angry and knitted brows, that the automaton was showing a great want of gallantry, and that he was worthy of the reputation he had gained. A knight and a bishop were taken, one after the other, in the clutch of the skilful Mussulman. From that time the game took a turn unfavorable to the Imperial player, when suddenly the Turk, forgetting his impassible gravity, violently struck his cushion with his arm, and replaced a chessman that had been advanced by his adversary.

Catherine II. had been guilty of cheating. Was it to test the automaton's intelligence, or from any other motive? We cannot tell. Nevertheless, the haughty Empress, not choosing to avow her peccadillo, replaced the piece on the square to which she had fraudulently pushed it, and stared at the automaton with an air of imperious authority.

The result soon followed. The Turk, with a single blow of his arm, upset every piece on the chess-board; and immediately the sound of clock-work, which was constantly going on during the game, ceased to be heard. The machine stopped, as if some spring inside it had been unexpectedly broken.

Von Kempelen, pale and trembling, recognizing Worosky's fiery temper, awaited in alarm the issue of this conflict between the outlaw and his sovereign.

"Aha, Monsieur l'Automate!" said the Empress gaily, glad to see thus concluded a

game in which her chance of success was but small; "your manners are somewhat inclined to be abrupt. You are a capital player, I must allow; but you were afraid of losing, and so you put the chess-board into an inextricable mess. That will do. I am now enlightened in respect to your talents, and especially as to your nervous temperament."

Von Kempelen began to breathe again; and, taking courage, he endeavored to efface entirely the unfavorable impression produced by his machine's want of respect,—a fault of which he was naturally obliged to take the whole responsibility upon his own shoulders.

"Will your majesty," he humbly said, "permit me to offer an explanation of what has just taken place?"

"By no means, Monsieur Von Kempelen," interrupted the Empress, with great vivacity. "There is no occasion for any thing of the kind. On the contrary, I have been highly entertained. I will even say that I am so delighted with your automaton that I wish to purchase it. I shall then always have at hand a chess-player whose temper is perhaps a little warm, but whose skill makes him a respectable adversary. Leave him, therefore, in this apartment, and come and see me to-morrow, and we will conclude the bargain."

So saying, and without waiting for Von Kempelen's answer, the Czarina left the room. In expressing her desire that the automaton should remain in the palace till the next day, had Catherine any intention of committing an indiscretion? It is more than probable; she was quite capable of any unusual conduct. Happily, the cunning artist baffled her female curiosity by smuggling Worowsky away in the case he had brought. The automaton remained in the library, but Worowsky was gone. Next day Catherine renewed her proposition to buy the automaton of Von Kempelen. He replied, that as his presence was necessary for the working of the machinery, he could not by any possibility sell it. The Empress acknowledged the force of his reasoning, and at the same time that she complimented him on his mechanical skill, presented him with a proof of her liberality.

Three months afterwards the automaton was in England, under the direction of a Mr. Anthon, or Antony, to whom Von Kempelen had made it over. Did Worowsky continue to make part of the machine? It is not known exactly; but we may conclude that it

was so, from the immense success which the chess-player had at the time, as may be seen in the contemporary journals. Anthon travelled all over Europe, attended by the same invariable success; but at his death the celebrated automaton was bought by the mechanician Maëzel, who embarked it for New York. It was doubtless then that Worowsky took leave of his hospitable Turk, for the chess-player was far from exhibiting the same prowess in America as he had in the Old World. After having travelled about for a considerable time, showing his mechanical trumpet and the chess-player, Maëzel set sail for France, which he was destined never to see again. He died on the passage from indigestion, brought on by over-eating. Maëzel's heirs sold his instruments, and that was the way in which Cronier obtained his precious relic.

The automata which Robert Houdin fabricated himself were far superior to the chess-player, both in mechanical merit and in boldness, though not in impudence of design. Setting aside his early essays, which were wonderful for a juvenile artist, several of his second-rate performances became favorites with all civilized Europe, and were repeated in numerous duplicates, under a variety of different but analogous forms. There was the tight-rope dancer, male and female; birds that sang, accompanying their melody with characteristic movements of their head and wings; and the juggler playing with the cups and balls. There was what was styled the mysterious clock, which, although transparent, indicated and struck the hour with the greatest exactness, and that without any apparent mechanism whatsoever to keep it going. More difficult to construct was the nightingale (ordered by a rich merchant of St. Petersburg), which imitated not merely the actions, but also the musical phrases of its prototype, giving by means of artificial wind-pipes a tolerable copy of the notes which bird-fanciers are wont to express in written characters, by something like "Tiou-tiou-tiou. Ut, ut, ut, ut. Tchitchou, tchitchou, rrrrrrrr-out," etc. Of a still higher order was the Secretary-Draughtsman, l'Ecrivain-Dessinateur, a figure who wrote or drew, at word of command, any thing reasonable that was requested of him.

The automata prepared for public exhibition, to serve as interludes between their author's feats of legerdemain, were really won-

deful. One of them, styled the Diavolo Antonio, after a famous acrobat of the day, was first exhibited at Robert Houdin's theatre on the 1st of October, 1849. The original was a full-grown man; the copy had only the stature and the features of a child. He took in the wooden artist in his arms, he tells us, exactly as he would have carried a living being; placed him upon the stick of a swing, and then put to him several questions, to which he replied by signs of the head. "Are you not afraid of falling?" "No." "Are you ready to go through with your exercises?" "Yes." Then, at the first strains of the orchestra, he gracefully saluted the spectators, turning himself towards the different parts of the house; then he suspended himself by the arms, and following the measures of the music (or the measures of the music following him), he began swinging backwards and forwards with extraordinary vigor. This great exertion required an interval of repose, during which he smoked his pipe; after which he performed feats of strength on the swing, such as raising himself by the arms, and remaining heels upwards, whilst he executed telegraphic evolutions with his legs. To prove that the little Diavolo's mechanical existence lay within himself, he suspended himself by his feet, and afterwards completely quitted the swing.

Robert Houdin, naturally very proud of his automata, was excessively susceptible that even their *utility* should be put in question. Although his own native good sense showed him the justice of such criticisms, they touched him to the quick at the time, as appears from the following confession, written in his honorable retirement near Blois:—

"After having acquired a position of material welfare by means of labors which have been wrongly treated as futile, I have determined to devote my attention to serious researches, as I was once advised to do by a member of the Institute. The circumstance to which I allude occurred during the Exposition of 1844, where I exhibited my automata and other mechanical curiosities. The jury deputed to examine the machines and instruments of precision visited my collection, and I gave in their presence a little performance, similar to that which had taken place a few days previously before Louis Philippe. After having listened with interest to my account of the difficulties which I had to overcome in the construction of my automata, one of the members of the jury remarked,—

"'It is a great pity, Monsieur Robert Houdin, that you have not applied to serious undertakings the same efforts of imagination which you have employed in the construction of fancy articles.'

"This criticism wounded me the more, because at that epoch I saw nothing superior to my own pieces of workmanship; in my brightest dreams respecting the future, I had no higher ambition than to rival the glory of the learned author of the automaton duck. I therefore replied, with considerable pique. 'Monsieur, I know no more serious undertaking than that of furnishing a livelihood to an honest man. Nevertheless, I am quite ready to change the direction of my studies if, after having heard what I have to say, you will favor me with your advice. All the while that I employed myself with chronometer making I could scarcely contrive to live. At present I maintain four workmen, who help me to complete my automata; the least skillful of the four earns six francs a-day: you may guess by that what I earn myself. I ask you now, Monsieur, whether I ought to return to my former profession?'

"My critic was silent; but another member of the jury approached me, and said in a low voice, 'Go on, Monsieur Robert Houdin, go on; I feel an assurance that your ingenious labors after having conducted you to prosperity, will lead you straight to make useful discoveries.'

"'Monsieur le Baron Séguier,' I replied, 'I thank you for your encouraging prognosis; I will use every endeavor to justify it.'

With the advantages of ease and leisure to help him, the worthy ex-conjurer has already done much to fulfil his promise, and probably will do more. A remnant of affection for his old trade of watch-making induced him to select chronometro-electric instruments as the object of his labors. He has adopted as the programme to be carried out, *The Popularization of Electric Clocks, by making them as simple and as accurate as possible*. And as the exercise of any art always supposes an ideal which the artist strives to realize, he already fancies that the day will arrive when a net-work of electric wires, starting from one sole regulator, will radiate over the whole of France, and will so give the exact time in the most modest villages as well as in the most important cities. Meanwhile, considerable results in advance of the former state of things have been already attained, a few amongst which are, an Electric Regulator, without any wheel-work, secure from the influence of vari-

ations in the electric currents; a popular Electric Clock, capable of carrying, without any farther expense of electricity, a dial-plate of more than six feet in diameter; an Electric striking Apparatus, without any wheel-work, capable of being carried to any distance whatsoever by the above-mentioned electric clock; and, finally, a *Répartiteur électrique*, -by means of which a magnetic attraction may be increased a hundredfold. This, in a mechanical point of view, is an entirely novel agent, which promises to be serviceable in a thousand different, unexpected ways. Be it not forgotten, that Robert Houdin has presented his native town with an electric clock, which adorns the façade of the Hôtel de Ville, and has gone for two years with the greatest regularity.

E. S. D.

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